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Abstract of the national paper of Brazil

I. General

1. Brazil was one of the first developing countries to institutionalize space activities, with the creation of space-oriented government organizations in the early 1960s. The origins of the National Institute for Space Research (INPE) date back to 1961, resulting from a common initiative of a group of civilian scientists and the Ministry of Aeronautics. Similarly, the origins of the Institute of Aeronautics and Space (IAE) go back to 1966 and the Barreira do Inferno Launch Centre, in the north-eastern state of Rio Grande do Norte, was inaugurated in 1965, both under the Ministry of Aeronautics. The coordination of the government organizations specializing in space activities was first established in 1971, with the setting up of the Brazilian Commission on Space Activities (COBAE), an inter-ministerial office.

2. From their early stages, Brazilian space activities have been motivated by peaceful purposes and the civilian character of the Brazilian programme has been formally emphasized in recent years. A major factor in that direction was the creation in 1994 of the Brazilian Space Agency (AEB), a civilian governmental organization under the Presidency of the Republic, replacing COBAE. Another important event was the country's admission to the Missile Technology Control Regime in 1995, clear evidence of Brazil's positive and constructive commitment to non-proliferation.

II. The present institutional framework

3. AEB, currently under the supervision of the Minister for Special Projects, acts as central coordinator of the National System for the Development of Space Activities (SINDAE). The Agency has the legal mandate to formulate national policy for the development of space activities and to formulate and implement the national space activities programme, whose major elements are presently carried out by other government organizations taking part in SINDAE.

4. INPE, under the Ministry of Science and Technology and with its headquarters located in São José dos Campos, in the south-eastern State of São Paulo, is in charge of projects devoted to the development of satellites and related technologies, as well as research and development in the fields of space sciences, including aeronomy, astrophysics and space geophysics, and space applications, in particular remote sensing, oceanography, meteorology and global change research.

5. IAE, also located in São José dos Campos, is responsible for the development of satelli launchers and sounding rockets. Additionally, the Ministry of Aeronautics is responsible f the development of a fully operational launch range at the Alcântara Launch Centre, in t northern state of Maranhão, and for running the Barreira do Inferno Launch Centre addition, the Ministry has assigned to Infraero, a state company under its supervision, the ro of promoting the commercial use of the Alcântara Launch Centre.

6. Brazilian universities and the private sector also take part in SINDAE. The universiti are becoming increasingly involved in basic research and technological developme activities, whereas the private sector has been engaged in the development of system equipment and services.

A. National policy for the development of space activities

7. Brazilian space policy—sanctioned by the President of the Republic December 1994—establishes major principles, objectives and guidelines for national spa activities. The major goal of those activities is defined as to foster the country's capacity utilize space resources and techniques—according to Brazilian preferences and criteria—order to solve national problems for the benefit of Brazilian society.

B. National space activities programme

8. The Brazilian space programme establishes initiatives to be pursued in order to achie the objectives identified in the national policy, consistent with its principles and guidelin The programme covers a 10-year period and is subject to periodic review. The current versi applies from 1998 to 2007 and is organized in seven major programmes, namely, spa applications, satellites and payloads, launch vehicles, space-related infrastructure, research a development, establishment and further training of human resources and development national industrial capability. The main objectives of the programme may be summarized follows:

(a) To develop and support space applications in areas of remote sensin meteorology, oceanography, communication, navigation and geodesy, with a view to solvi national problems;

(b) To perform research and development in the fields of space and atmospher sciences, focusing mainly on phenomena of global concern or of particular interest to Braz

(c) To establish and maintain capability for design and construction of soundi rockets and satellite launching vehicles that meet the requirements of the country's spa programme and of the international market;

(d) To establish and maintain the infrastructure required by science, application a system development programmes, including launch centres;

(e) To foster the Brazilian private sector's participation and competitiveness in t market for space goods and services.

9. Among the important achievements of the Brazilian space programme, besides tho mentioned below in the context of international cooperation initiatives, the following deser special mention: the development and successful launching of two data-collecting satellite in 1993 and 1998, both still in good working condition; the development of a very successf family of sounding rockets, named Sonda, and of a small satellite-launching vehicle, t VLS-1, at present at the stage of flight qualification; the building of the Alcântara Laun Centre, currently being prepared to offer satellite-launching services on the internatio market; the pioneer research, the first ever in South America, on the equatorial ionosphe

plasma anomaly, which may have a drastic effect on telecommunications, as well as on the depletion of the ozone layer, whose adverse consequences are well known; and the systematic use of remote sensing imagery to estimate the rate of deforestation in the Amazon region.

III. International cooperation

10. International cooperation has played a key role in the planning and implementation of Brazilian space activities. Starting in the early 1960s, when the Government of Brazil began the consolidation of the institutional structures in the space field, several "space-faring" countries, including some of the major ones, initiated a very fruitful and lasting partnership with Brazil. Since the establishment of AEB in 1994 and consistent with the orientation of its space policy, which recognized the international trends towards the enhancement and expansion of space cooperation, as well as the beneficial integrative potential of those initiatives, the Government has signed five framework agreements on space cooperation for peaceful purposes, with China (November 1994), the United States of America (March 1996), Argentina (April 1996), the Russian Federation (November 1997) and France (November 1997). A similar agreement is about to be signed with the Government of Ukraine.

11. Space cooperation with China dates back to the 1980s and is centred on the development and manufacturing of two remote-sensing satellites, the China-Brazil Earth Resources Satellites (CBERS), designed for global coverage using optical visible and infrared cameras. CBERS-1 is due to be launched in the current year.

12. As a result of an implementing agreement with the United States, Brazil has joined the International Space Station programme. The Brazilian contribution will include the development and provision of flight equipment and payloads and, as part of the preparation for the ISS programme, a Brazilian astronaut-candidate is now being trained by the National Aeronautics and Space Administration (NASA) of the United States. Cooperation with the United States also includes the development of a humidity sensor that will be part of the payload of NASA's EOS-PM1 satellite, as a part of the Earth observation system programme. Furthermore, a Brazilian charge coupled device remote-sensing camera is scheduled for experimental flights on board the Space Shuttle.

13. France, Germany and the Russian Federation have also been traditional partners of Brazil in the space area. Recently, AEB and the Centre national d'études spatiales of France have signed and are implementing two agreements for the development of a propulsion system for mini-satellites and for the joint development of a micro-satellite to be launched by the Brazilian launching vehicle VLS-1. In addition, technical working groups of both agencies, under the institutional framework of a common strategic group, are trying to identify further opportunities for cooperation, including common interests in the development of a new low-Earth orbit satellite launch vehicle.

14. The cooperation with Latin American countries has been pursued by several means, including training courses, especially on remote sensing, and the provision of remote data-collecting platforms to be used in connection with the Brazilian data-collection satellite. In the case of Argentina, the relationship was strengthened through the signature in 1998 of four programmes of cooperation, notably the preliminary studies on the development of the Argentine-Brazilian Satellite for Information on Food, Water and Environment (SABIA), designed to cover the entire region of the Southern Common Market (MERCOSUR).

15. Brazil has also participated effectively in the works of the Committee on the Peaceful Uses of Outer Space, acting as rapporteur from its creation in 1959 until 1997. In the spirit of contributing to the objectives of the United Nations Programme on Space Applications, in

1997 Brazil and Mexico signed an agreement for the establishment of the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, to be affiliated to the United Nations. The Brazilian site of the Regional Centre is already established on the main campus of INPE and is expected to be fully operational before the end of 1999.